

Claims:

- 1 1. A user input device comprising:
2 a switch matrix having a plurality of plurality of rows and columns;
3 scan logic operable to detect signals corresponding to operation of said rows and columns of
4 said switch matrix and to generate an output signal in response thereto;
5 a test control bus operable to provide test signals to said scan logic;
6 a storage module for storing an executable test sequence program for generating a plurality
7 of signals corresponding to a known operating condition of said switch matrix;
8 a general purpose input-output (GPIO) module operable to provide said a plurality of test
9 signals to said scan logic via said test control bus; and
10 a processor operable to initiate execution of said executable test sequence program and
11 further operable to compare said output signal of said scan logic to a known
12 reference signal to obtain an indication of the operating condition of said scan logic.
- 1 2. The user input device of claim 1, wherein the test signals provided by the GPIO module
2 comprise a minidriver.
- 1 3. The user input device of claim 1, wherein the scan logic operates in first and second states,
2 wherein said scan logic receives signals from said switch matrix in said first state and wherein said
3 scan logic receives test signals from the test control bus in said second state.
- 1 4. The user input device of claim 3, wherein the GPIO module is operable to switch said scan
2 logic from said first state to said second state in response to control signals generated by said
3 processor.

1 5. A method of testing a key switch matrix on a user input device, comprising:
2 providing a plurality of test signals via a general purpose input-output module (GPIO) to an
3 input of a scan logic module;
4 processing said test signals using said scan logic and generating an output signal therefrom;
5 comparing said output signal to a reference signal corresponding to a known operation
6 condition of said switch matrix;
7 generating an error signal if said output signal differs from said reference signal
8 corresponding to said known operating condition of said switch matrix.

1 6. The method of claim 5, wherein the test signals provided by the GPIO module comprise a
2 minidriver.

1 7. The method of claim 5, wherein the scan logic operates in first and second states, wherein
2 said scan logic receives signals from said switch matrix in said first state and wherein said scan
3 logic receives said test signals in said second state.

1 8. The user input device of claim 7, wherein the scan logic is switched from said first state to
2 said second state by the GPIO in response to a control signal from a processor.

1 9. A system that services communications between a wirelessly enabled host and at least one
2 user input device, comprising:

3 a wireless interface unit that wirelessly interfaces with the wirelessly enabled host;

4 a processing unit operably coupled to the wireless interface unit;

5 an input/output unit operably coupled to the wireless interface unit and to the processing
6 unit, wherein the input/output unit also operably couples to the user input device;

7 and

8 a user input device, comprising:

9 a switch matrix having a plurality of plurality of rows and columns;

10 scan logic operable to detect signals corresponding to operation of said rows and
11 columns of said switch matrix and to generate an output signal in response
12 thereto;

13 a test control bus operable to provide test signals to said scan logic;

14 a storage module for storing an executable test sequence program for generating a
15 plurality of signals corresponding to a known operating condition of said
16 switch matrix;

17 a general purpose input-output (GPIO) module operable to provide said a plurality
18 of test signals to said scan logic via said test control bus; and

19 a processor operable to initiate execution of said executable test sequence program
20 and further operable to compare said output signal of said scan logic to a
21 known reference signal to obtain an indication of the operating condition of

22 said scan logic.

1 10. The user input device of claim 9, wherein the test signals provided by the GPIO module
2 comprise a minidriver.

1 11. The user input device of claim 9, wherein the scan logic operates in first and second states,
2 wherein said scan logic receives signals from said switch matrix in said first state and wherein said
3 scan logic receives test signals from the test control bus in said second state.

1 12. The user input device of claim 11, wherein the test control bus is operable to switch said
2 scan logic from said first state to said second state.

1 13. A user input device comprising:
2 a plurality of sensors operable to generate quadrature signals corresponding to operation of
3 said user input device;
4 quadrature signal detection circuitry operable to state changes in said quadrature signals and
5 to generate an output signal in response thereto;
6 a test control bus operable to provide test signals to said quadrature signal detection
7 circuitry;
8 a storage module for storing an executable test sequence program for generating a plurality
9 of signals corresponding to a known operating condition of said quadrature sensors;
10 a general purpose input-output (GPIO) module operable to provide said a plurality of test
11 signals to said quadrature signal detection circuitry via said test control bus; and
12 a processor operable to initiate execution of said executable test sequence program and

13 further operable to compare said output signal of said quadrature signal detection
14 circuitry to a known reference signal to obtain an indication of the operating
15 condition of quadrature detection circuitry.

1 14. The user input device of claim 13, wherein the test signals provided by the GPIO module
2 comprise a minidriver.

1 15. The user input device of claim 13, wherein the scan logic operates in first and second states,
2 wherein said scan logic receives signals from said switch matrix in said first state and wherein said
3 scan logic receives test signals from the test control bus in said second state.

1 16. The user input device of claim 15, wherein the GPIO module is operable to switch said scan
2 logic from said first state to said second state in response to control signals generated by said
3 processor.

1 17. A method of testing a key switch matrix on a user input device, comprising:
2 providing a plurality of test signals via a general purpose input-output module (GPIO) to an
3 input of a scan logic module;
4 processing said test signals using said scan logic and generating an output signal therefrom;
5 comparing said output signal to a reference signal corresponding to a known operation
6 condition of said switch matrix;
7 generating an error signal if said output signal differs from said reference signal
8 corresponding to said known operating condition of said switch matrix.

1 18. The method of claim 17, wherein the test signals provided by the GPIO module comprise a

minidriver.

19. The method of claim 17, wherein the scan logic operates in first and second states, wherein said scan logic receives signals from said switch matrix in said first state and wherein said scan logic receives said test signals in said second state.

20. The user input device of claim 19, wherein the scan logic is switched from said first state to said second state by the GPIO in response to a control signal from a processor.

21. A system that services communications between a wirelessly enabled host and at least one user input device, comprising:

a wireless interface unit that wirelessly interfaces with the wirelessly enabled host;

a processing unit operably coupled to the wireless interface unit;

an input/output unit operably coupled to the wireless interface unit and to the processing unit, wherein the input/output unit also operably couples to the user input device;

and

a user input device, comprising:

a plurality of sensors operable to generate quadrature signals corresponding to operation of said user input device;

quadrature signal detection circuitry operable to state changes in said quadrature signals and to generate an output signal in response thereto;

a test control bus operable to provide test signals to said quadrature signal detection circuitry;

a storage module for storing an executable test sequence program for generating a

16 plurality of signals corresponding to a known operating condition of said
17 quadrature sensors;
18 a general purpose input-output (GPIO) module operable to provide said a plurality
19 of test signals to said quadrature signal detection circuitry via said test
20 control bus; and
21 a processor operable to initiate execution of said executable test sequence program
22 and further operable to compare said output signal of said quadrature signal
23 detection circuitry to a known reference signal to obtain an indication of the
24 operating condition of quadrature detection circuitry.

1 21. The user input device of claim 21, wherein the test signals provided by the GPIO module
2 comprise a minidriver.

1 22. The user input device of claim 21, wherein the scan logic operates in first and second states,
2 wherein said scan logic receives signals from said switch matrix in said first state and wherein said
3 scan logic receives test signals from the test control bus in said second state.